Ligation of Esophageal Varices

Shou-jiang Tang, University of Mississippi Medical Center, Jackson, MS, USA

Received 14 August 2012; Revision submitted 29 September 2012; Accepted 3 October 2012

Abstract

Esophageal varices are present in majority of the patients with hepatic cirrhosis at the time of diagnosis, especially in those with advanced liver disease. Variceal size, red wale marks on varices, and advanced liver disease are risk factors for variceal hemorrhage. Esophageal variceal ligation (EVL) is a standard endoscopic procedure in the management of acute variceal bleeding and is beneficial in the primary and secondary prophylaxis of esophageal variceal bleeding. Multiband devices are commonly used for EVL. Various endoscopic techniques, common clinical scenarios, and procedure-related complications in EVL are described in the video manuscript provided. This article is part of an expert video encyclopedia.

Keywords

Band ligation; Endoscopy; Esophageal variceal ligation; Esophageal varices; Portal hypertension; Standard endoscopy; Ulceration; Video.

Video Related to this Article

Video available to view or download at doi:10.1016/S2212-0971(13)70037-2

Materials

- Band ligation device: Six Shooter®; Cook Medical, Winston-Salem, NC, USA.
- Endoclip: Instinct® clip; Cook Medical, Winston-Salem, NC, USA.

Background and Endoscopic Procedure

Esophageal varices (EV) are present in majority of the patients with hepatic cirrhosis at the time of diagnosis, especially in patients with advanced liver disease. Development and growth of varices occur at a rate of 7% per year. Variceal size, red wale marks on varices, and advanced liver disease are risk factors for variceal hemorrhage. The recurrent bleeding risk is close to 60% within 1 year. Endoscopic interventions include esophageal variceal ligation (EVL), injection sclerotherapy, temporary balloon tamponade, and esophageal stenting.

EVL causes scarring, resulting in variceal eradication. EVL is a standard procedure in the management of acute variceal bleeding and is beneficial in the primary and secondary prophylaxis of esophageal variceal bleeding. Multiband devices are commonly used for EVL and do not require overtube placement for device passage. Before EVL, a diagnostic endoscopy is performed to evaluate the severity and locations of EV. Typically, 5–10 bands are placed during EVL, starting at the gastroesophageal junction and progressing upward for ~5–8 cm. An early study suggests that placement of more bands (>6 per session) does not seem to improve patient outcomes. Two bands are usually placed ~2 cm apart on each varix. EVL is repeated every 2–4 weeks until variceal obliteration occurs or too small to band, and this normally requires two to four sessions. If the esophageal varix is actively bleeding or a varix with a hemocystic spot is found, the first band is usually placed on this spot. The hemocystic spot or 'nipple' sign is a major stigma of recent bleeding. Once a large varix is suctioned in the banding cap, a concerted effort is needed to complete the band ligation in order to minimize the risk of device-induced variceal bleeding. Uncommonly, inadvertent varix slippage outside the cap or premature band dislodge can lead to severe variceal hemorrhage. For relatively small EV or previously treated varix, it may be difficult to achieve significant prolapse of tissue inside the banding cap. Gentle pulling and rotating maneuvers on the endoscopic shaft by the right hand facilitate suctioning more variceal tissue into the cap before band placement. Close endoscopic surveillance and retreatment are necessary because the varices tend to recur. Current guidelines recommend the combined use of endoscopic variceal ligation and nonselective β-blockers for the prevention of recurrent variceal hemorrhage. After successful variceal eradication, perform surveillance endoscopy every 6–12 months indefinitely.

Potential complications associated with EVL include post-banding ulcer and temporary chest pain. Bleeding from the post-banding ulceration is not infrequent. A banding device with a longer retention rate may decrease the bleeding risk. In the author's experience, the rubber bands on the 4,6,10 Six Shooter® tend to offer a longer retention rate and a lower dislodgement rate compared to the neoprene bands on other ligation devices. In the treatment of such actively bleeding ulcers, treatment options are very limited. The author and colleagues prefer using endoclips (Instinct® clip; Cook Medical, Winston-Salem, NC, USA) to achieve hemostasis by ligating the bleeding vessel and approximating the ulcer margins.

This article is part of an expert video encyclopedia. Click here for the full Table of Contents.

Key Learning Points/Tips and Tricks

- Before EVL, a diagnostic endoscopy is performed to evaluate the severity and locations of EV.
- Typically, 5–10 bands are placed during EVL, starting at the gastroesophageal junction and progressing upwards for ~5–8 cm. Two bands are usually placed ~2 cm apart on each varix.
- An early study suggests that placement of more bands (>6 per session) does not seem to improve patient outcomes.
- If the esophageal varix is actively bleeding or a varix with a hemocystic spot is found, the first band should be placed on this spot. The hemocystic spot or 'nipple' sign is a major stigma of recent bleeding.
- Once a large varix is suctioned in the banding cap, a concerted effort is needed to complete the band ligation in order to minimize the risk of device-induced variceal bleeding.
- Before band deployment, the target varix is suctioned into the banding cap by continuous suction until a 'pink or red out sign' is observed.
- For relatively small and/or previously treated EV, gentle pulling and rotating maneuvers on the endoscopic shaft by the right hand facilitate suctioning more tissue into the banding cap.
- EVL is repeated every 2–4 weeks until variceal obliteration occurs, and this normally requires two to four sessions.
- During acute variceal bleeding, elective endotracheal intubation maybe considered for airway protection, and intravenous octreotide administration is beneficial.
- Bleeding from the post-banding ulceration is not infrequent. The usage of endoclips is preferred to achieve hemostasis by ligating the bleeding vessel and to approximating the ulcer margins.
- Patients with small varices on screening endoscopy should undergo a repeat procedure every 1–2 years, and those without varices should repeat the esophagogastroduodenoscopy every 3 years.
- Following variceal eradication, endoscopy should be repeated every 6–12 months and recurrent varices should be treated with EVL.

Complications and Risk Factors

Pain, post-banding ulcer, and bleeding.

Alternatives

Splanchnic vasoconstrictor during acute bleeding, injection sclerotherapy, balloon tamponade, temporary esophageal stenting, transjugular intrahepatic portosystemic shunt, and surgical shunting.

Scripted Voiceover

Time (min:sec)	*Voiceover text*
00:04	Esophageal varices are present in almost half of all patients with cirrhosis at the time of diagnosis.
00:12	Variceal size, red wale marks on varices, and advanced liver disease are risk factors for variceal hemorrhage.
00:21	Esophageal variceal ligation (EVL) is a standard procedure in the management of acute variceal bleeding and is beneficial in the prophylaxis of esophageal variceal bleeding.
00:33	We favor multiband ligation devices in treating esophageal varices. These devices allow rapid loading and deployment of bands.
00:44	Before EVL, a diagnostic endoscopy is performed to evaluate the severity and locations of esophageal varices.
00:55	Typically, 5 to 10 bands are placed during EVL, starting at the GE junction and progressing upwards for ~5–8 cm.
01:08	Overtube placement is not required for multiband device passage.
01:17	EVL should start at the GE junction.
01:21	During EVL, first position and center the varix by slight endoscope tip deflection, then apply continuous suction on the target varix.
01:35	After an adequate amount of tissue is prolapsed into the banding cap, evidenced by a "pink or red out sign", a band is released by slowly turning the firing wheel in a clockwise direction.
01:50	The suction is immediately released and endoscope tip deflection is reversed.
01:58	Two bands are usually placed ~2 cm apart on each varix.
02:04	EVL is repeated every 2–4 weeks until variceal obliteration occurs, and this normally requires 2–4 sessions.
02:16	Early study suggests that placement of more bands (>6 per session) does not seem to improve patient outcomes.
02:27	If the esophageal varix is actively bleeding or a varix with a hemocystic spot is found, the first band is usually placed on this spot.
02:40	Hemocystic spot or "nipple" sign is a major stigma of recent bleeding and it should be treated first.
02:54	Once a large varix is suctioned in the banding cap, a concerted effort is needed to complete the band ligation in order to minimize the risk of device induced variceal bleeding.
03:11	Infrequently, inadvertent varix slippage outside the cap or premature band dislodgement can lead to severe variceal hemorrhage.
03:25	Sometimes, mild bleeding can be observed after a band is placed and this is from rupture of the banded varix. The bleeding is self-limited.
03:43	For relatively small esophageal varix or previously treated varix, it may be difficult to suction adequate tissue into the banding cap.

03:52	Gentle pulling and rotating maneuvers on the endoscopic shaft by the right hand facilitate prolapsing more tissue into the banding cap before band placement.
04:05	After successful variceal eradication, close endoscopic surveillance and retreatment are necessary since the varices tend to recur.
04:17	It is recommended to perform surveillance endoscopy every 6–12 months indefinitely.
04:27	Potential complications associated with EVL include post-banding ulcer and temporary chest pain.
04:42	This patient had EVL 2 weeks ago prior to current endoscopy.
04:51	Bleeding from the post-banding ulceration is not infrequent.
04:55	Banding devices with a longer retention rate and a lower dislodgement rate may decrease the bleeding risk.
05:04	In our experience, the rubber bands on the Six Shooter® tend to offer longer band retention compared to the neoprene bands used on other ligation devices.
05:19	In the treatment of such actively bleeding ulcers, treatment options are very limited.
05:25	We prefer using endoclips to achieve hemostasis.
05:34	In this case, two endoclips are easily deployed to ligate the bleeding vessel and to approximate the ulcer margins.
05:53	Thank you for your attention.

Further Reading

ASGE Technology CommitteeLiu, J.; Petersen, B. T.; Tierney, W. M.; *et al.* Endoscopic Banding Devices. *Gastrointest. Endosc.* **2008**, *68*(2), 217–221.

Garcia-Tsao, G.; Bosch, J. Management of Varices and Variceal Hemorrhage in Cirrhosis. *N. Engl. J. Med.* **2010**, *362*(9), 823–832.

Qureshi, W.; Adler, D. G.; Davila, R.; *et al.* ASGE Guideline: The Role of Endoscopy in the Management of Variceal Hemorrhage. *Gastrointest. Endosc.* **2005**, *62*(5), 651–655.

Ramirez, F. C.; Colon, V. J.; Landan, D.; *et al.* The Effects of the Number of Rubber Bands Placed at Each Endoscopic Session Upon Variceal Outcomes: A Prospective, Randomized Study. *Am. J. Gastroenterol.* **2007**, *102*(7), 1372–1376.

Tang, S. J.; Rockey, D. C. Endoscopic Variceal Ligation – Is There Any Benefit to Placing More Than Six Bands? *Nat. Clin. Pract. Gastroenterol. Hepatol.* **2008**, *5*(4), 198–199.